

Listing of Claims:

1. (Currently Amended) A transmission state indicating method for a predetermined transmission system, by SONET (Synchronous Optical Network)/SDH (Synchronous Digital Hierarchy), in which high capacity data is divided into a plurality of low capacity virtual containers and transmitted via a plurality of channels which configure a communication network by the SONET/SDH based on clocks at the respective channels, the method comprising:

acquiring a multiplexed frame in which mapping, accompanying delay absorption processings corresponding to transmission states at the respective channels, has been carried out based on a reference clock with respect to virtual containers at the respective channels included in a plurality of frames including the plurality of low capacity virtual containers;

successively detecting factors at the respective channels which are respectively included in the plurality of frames included in the multiplexed frame, and which are to be objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values ~~for respectively evaluating the transmission states~~ indicating a variation in phase or transmission delay

during transmission at said plurality of channels which configure the communication network by the SONET/SDH;

successively correcting the plurality of pointer values based on variations in phases at the respective channels which are detected from phase differences between the clocks at the respective channels and the reference clock; and

indicating the plurality of pointer values successively corrected, at the same time, corresponding to the plurality of channels.

2. (Original) The transmission state indicating method according to claim 1, further comprising:

storing said plurality of pointer values in association with information for indicating said plurality of pointer values at the same time in accordance with said plurality of channels; and

reading out the plurality of pointer values stored in association with the information for indicating the plurality of pointer values corresponding to the plurality of channels, at the same time.

3. (Original) The transmission state indicating method according to claim 1, further comprising:

carrying out processing for indicating said plurality of pointer values by relative values with respect to a pointer value

5 of a reference channel to be a reference among said plurality of channels when said plurality of pointer values are indicated at the same time corresponding to the plurality of channels.

4. (Currently Amended) The transmission state indicating method according to claim 1, wherein ~~, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of
5 the respective channels to be objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH
10 (Section Overhead) frame in which the plurality of frames are frames of an STM (Synchronous transfer mode) and which is added to the payload of the frame of the STM.

5. (Currently Amended) The transmission state indicating method according to claim 1, wherein ~~, when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of
5 the respective channels to be objects for the delay absorption processings, a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to head portions of the

respective virtual containers in case where said plurality of frames are frames of an STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

6. (Currently Amended) The transmission state indicating method according to claim 1, wherein ~~when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of the respective channels to be the objects for the delay absorption processings, values of AU (Administrative Unit) pointers included in H1 bytes and H2 bytes which have been defined to show head portions of the virtual containers in case where the low capacity containers are contained in a payload, at the 4th row of an SOH (Section Overhead) frame in which said plurality of frames are frames of an STM (Synchronous transfer mode) and which is added to the payload of the frame of the STM, and a value of H4 byte which has been defined at the 6th row of a POH (Pass Overhead) added to the head portions of the respective virtual containers in case where said plurality of frames are frames of the STM (Synchronous transfer mode) and the virtual containers included in the frames of the STM are a VC-3 format or a VC-4 format.

7. (Original) The transmission state indicating method according to claim 1, further comprising:

converting the multiplexed frame on which mapping has been carried out into a concatenation mapping frame according to the rules of concatenation mapping; and

detecting a plurality of index values included in the concatenation mapping frame converted according to rules of the concatenation mapping in place of the multiplexed frame on which mapping has been carried out.

8. (Currently Amended) A transmission state indicating apparatus for a predetermined transmission system by SONET (Synchronous Optical Network)/SDH (Synchronous Digital Hierarchy), in which high capacity data is divided into a plurality of low capacity virtual containers and transmitted via a plurality of channels which configure a communication network by the SONET/SDH based on clocks at the respective channels, the apparatus comprising:

a multiplexed frame acquiring unit which acquires a multiplexed frame in which mapping, accompanying delay absorption processings corresponding to transmission states at the respective channels, has been carried out based on a reference clock with respect to the virtual containers at the respective

channels included in a plurality of frames including said
15 plurality of low capacity virtual containers;

20 a pointer value detecting unit which successively detects factors at the respective channels which are respectively included in the plurality of channels included in the multiplexed frame acquired by the multiplexed frame acquiring unit, and which are to be objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values ~~for respectively evaluating the transmission states~~ indicating a variation in phase or transmission delay during transmission at the plurality of
25 channels which configure the communication network by the SONET/SDH, and which successively corrects the plurality of pointer values based on variations in phases at the respective channels to be detected from phase differences between the clocks at the respective channels and the reference clock; and

30 a display unit which indicates the plurality of pointer values successively detected and corrected by the pointer value detecting unit, at the same time, corresponding to the plurality of channels.

9. (Original) The transmission state indicating apparatus according to claim 8, further comprising:

a storage unit which stores said plurality of pointer values successively detected and corrected by the pointer value detecting unit in association with information for indicating the plurality of pointer values at the same time in accordance with the plurality of channels; and

a control unit which reads said plurality of pointer values stored in association with the information for indicating said plurality of pointer values corresponding to the plurality of channels at the storage unit, at the same time.

10. (Original) The transmission state indicating apparatus according to claim 8, further comprising:

a control unit which carries out processing for indicating the plurality of pointer values successively detected and corrected by the pointer value detecting unit, by relative values with respect to a pointer value of a reference channel to be a reference among the plurality of channels in the case where said plurality of pointer values are indicated at the same time corresponding to the said plurality of channels.

11. (Currently Amended) The transmission state indicating apparatus according to claim 8, wherein ~~when the predetermined transmission system is an SDH (Synchronous Digital Hierarchy) system,~~ the plurality of pointer values include, as factors of

5 the respective channels to be objects for the delay absorption
processings, values of AU (Administrative Unit) pointers included
in H1 bytes and H2 bytes which have been defined to show head
portions of the virtual containers in case where the low capacity
containers are contained in a payload, at the 4th row of an SOH
10 (Section Overhead) frame in which the plurality of frames are
frames of an STM (Synchronous transfer mode) and are added to
payloads of the frames of the STM.

12. (Currently Amended) The transmission state indicating
apparatus according to claim 8, wherein ~~when the predetermined~~
~~transmission system is an SDH (Synchronous Digital Hierarchy)~~
~~system~~, the plurality of pointer values include, as factors of
5 the respective channels to be objects for the delay absorption
processings, a value of H4 byte which has been defined at the 6th
row of a POH (Pass Overhead) added to head portions of the
respective virtual containers in case where the plurality of
frames are frames of an STM (Synchronous transfer mode) and the
10 virtual containers included in the frames of the STM system are a
VC-3 format or a VC-4 format.

13. (Currently Amended) The transmission state indicating
apparatus according to claim 8, wherein ~~when the predetermined~~
~~transmission system is an SDH (Synchronous Digital Hierarchy)~~

~~system,~~ the plurality of pointer values include, as factors of
5 the respective channels to be objects for the delay absorption
processings, values of AU (Administrative Unit) pointers included
in H1 bytes and H2 bytes which have been defined to show head
portions of the virtual containers in case where the low capacity
containers are contained in a payload, at the 4th row of an SOH
10 (Section Overhead) frame in which said plurality of frames are
frames of an STM (Synchronous transfer mode) and are added to the
payload of the frame of the STM, and a value of H4 byte which has
been defined at the 6th row of a POH (Pass Overhead) added to the
head portions of the respective virtual containers when the
15 plurality of frames are frames of the STM (Synchronous transfer
mode) and the virtual containers included in the frames of the
STM are a VC-3 format or a VC-4 format.

14. (Original) The transmission state indicating apparatus
according to claim 8, further comprising:

a frame converting unit which converts the multiplexed frame
acquired by the multiplexed frame acquiring unit into a
5 concatenation mapping frame according to the rules of
concatenation mapping; and

an index value detecting unit which detects a plurality of
index values included in the concatenation mapping frame

converted according to rules of the concatenation mapping by the
10 frame converting unit.

15. (Currently Amended) A transmission state indicating
apparatus for a predetermined transmission system by SONET
(synchronous Optical Network)/SDH (synchronous digital
Hierarchy), in which high capacity data is divided into a
5 plurality of low capacity virtual containers and transmitted via
a plurality of channels which configure a communication network
by the SONET/SDH based on clocks at the respective channels, the
apparatus comprising:

a plurality of clock reproducing units which reproduce
10 clocks of the respective channels from reception signals of a
plurality of frames including the plurality of low capacity
virtual containers;

a plurality of frame receiving units which receive the
plurality of frames including the plurality of low capacity
15 virtual containers in which the high capacity data is divided
into the plurality of low capacity virtual containers and
transmitted via the plurality of channels which configure the
communication network by the SONET/SDH, corresponding to the
plurality of the respective channels, and detect the virtual
20 containers at the respective channels based on the clocks of the

respective channels reproduced by the plurality of clock reproducing units;

a reference clock generating unit which generates a reference clock;

25 a frame assembling unit which carries out mapping with respect to the virtual containers at the respective channels included in the plurality of the frames received corresponding to the plurality of channels by the plurality of frame receiving units, based on the reference clock from the reference clock
30 generating unit, accompanying delay absorption processings corresponding to the transmission states of the respective channels, so as to be produce a multiplexed frame;

a pointer value detecting unit which successively detects factors at the respective channels which are respectively
35 included in the plurality of frames included in the multiplexed frame on which mapping has been carried out by the frame assembling unit, and which are to be objects for delay absorption processings corresponding to the transmission states at the respective channels, as a plurality of pointer values for
40 ~~respectively evaluating transmission states~~ indicating a variation in phase or transmission delay during the transmission at the plurality of channels which configure the communication network by the SONET/SDH, and successively corrects the plurality of pointer values based on variations in phases at the respective

45 channels to be detected from phase differences between the clocks
at the respective channels reproduced by the plurality of clock
reproducing units and the reference clock generated by the
reference clock generating unit;

an information storage unit which stores the plurality of
50 pointer values successively detected and corrected by the pointer
value detecting unit in association with information for
indicating the plurality of pointer values in accordance with the
plurality of channels; and

a display unit which indicates, at the same time, the
55 plurality of pointer values for respectively evaluating the
transmission states of the plurality of channels which configure
the communication network by the SONET/SDH, corresponding to the
plurality of channels, based on the plurality of pointer values
and the information for indicating the plurality of pointer
60 values corresponding to the plurality of channels which have been
stored in association with one another in the information storage
unit.

16. (Original) The transmission state indicating apparatus
according to claim 15, further comprising:

a control unit which carries out processing for indicating
the plurality of pointer values by relative values with respect

5 to a pointer value of a reference channel to be a reference among
the plurality of channels on the display unit.

17. (Currently Amended) The transmission state indicating
apparatus according to claim 15, wherein ~~, when the predetermined
transmission system is an SDH (Synchronous Digital Hierarchy)
system,~~ the plurality of pointer values include, as factors of
5 the respective channels to be objects for the delay absorption
processings, values of AU (Administrative Unit) pointers included
in H1 bytes and H2 bytes which have been defined to show head
portions of the virtual containers in case where the low capacity
containers are contained in a payload, at the 4th row of an SOH
10 (Section Overhead) frame in which the plurality of frames are
frames of an STM (Synchronous transfer mode) and are added to the
payload of the frame of the STM.

18. (Currently Amended) The transmission state indicating
apparatus according to claim 15, wherein ~~, when the predetermined
transmission system is an SDH (Synchronous Digital Hierarchy)
system,~~ the plurality of pointer values include, as factors of
5 the respective channels to be objects for the delay absorption
processings, a value of H4 byte which has been defined at the 6th
row of a POH (Pass Overhead) added to head portions of the
respective virtual containers in case where the plurality of

frames are frames of an STM (Synchronous transfer mode) and the
virtual containers included in the frames of the STM are a VC-3
format or a VC-4 format.

19. (Currently Amended) The transmission state indicating
apparatus according to claim 15, wherein ~~, when the predetermined
transmission system is an SDH (Synchronous Digital Hierarchy)
system,~~ the plurality of pointer values include, as factors of
the respective channels to be objects for the delay absorption
processings, values of AU (Administrative Unit) pointers included
in H1 bytes and H2 bytes which have been defined to show head
portions of the virtual containers in case where the low capacity
containers are contained in a payload, at the 4th row of an SOH
(Section Overhead) frame in which the plurality of frames are
frames of an STM (Synchronous transfer mode) and are added to the
payload of the frame of the STM, and a value of H4 byte which has
been defined at the 6th row of a POH (Pass Overhead) added to the
head portions of the respective virtual containers in case where
said plurality of frames are frames of the STM (Synchronous
transfer mode) and the virtual containers included in the frames
of the STM are a VC-3 format or a VC-4 format.

20. (Original) The transmission state indicating apparatus
according to claim 15, further comprising:

5 a frame converting unit which converts the multiplexed frame
on which mapping has been carried out by the frame assembling
unit into a concatenation mapping frame according to rules of
concatenation mapping; and

 an index value detecting unit which detects a plurality of
index values included in the concatenation mapping frame
converted according to the rules of the concatenation mapping by
the frame converting unit.